
British Standard Specification for
**Steel globe valves, globe stop and check valves
and lift type check valves**

Robinets à soupape, clapets de non-retour blocables à levée verticale et clapets de non-retour à levée verticale en acier — Spécifications

Kugelhähne, Kugelabsperrentile und -rückschlagventile, und senkrecht arbeitende Rückschlagventile, aus Stahl

Foreword

This British Standard has been prepared under the direction of the Piping Systems Components Standards Committee and constitutes the first revision of BS 5160 : 1977 which is withdrawn.

At the time of publication of this British Standard, no corresponding international standard exists.

In carrying out this revision, the types and ranges of valves covered have been changed. The essential differences between this British Standard and BS 5160 : 1977 are:

- (a) valves having butt-weld ends are included for the first time;
- (b) tolerances on face-to-face, end-to-end and centre-to-end dimensions have been changed to obtain a practical compromise between European and American practices and this will become the practice for future British Standards for valves;
- (c) the materials given for the body, bonnet and stuffing box have been updated and are now a requirement;
- (d) production pressure testing requirements are now specified in detail by reference to BS 6755 : Part 1.

Assessed capability. Users of this British Standard are advised to consider the desirability of assessment and registration of a supplier's quality systems against the appropriate Part of BS 5750 by a third party certification body.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

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Section one. General

1.1 Scope

This British Standard specifies requirements for flanged body end and butt-weld end carbon steel globe, globe stop and check valves having a rising stem and outside screw and lift type check valves with hard metal, nickel alloy or stainless steel facings.

It covers valves of pressure designations PN 16, PN 25 and PN 40 with ends flanged in accordance with the appropriate tables of BS 4504 : Section 3.1 and Class 150, Class 300 and Class 600 with butt-weld ends and with ends flanged in accordance with the appropriate tables of BS 1560 : Section 3.1 in nominal sizes DN 15 to DN 450 and NPS ½ to NPS 18 inclusive.

NOTE 1. The information to be supplied by the purchaser at the time of the enquiry/order is given in appendix A.

NOTE 2. The titles of the publications referred to in this standard are listed on the inside back cover.

1.2 Definitions

For the purposes of this British Standard the following definitions apply.

1.2.1 nominal size (DN) (for PN designated valves).

A numerical designation of size which is common to all components in a piping system other than components designated by outside diameters or by thread size. It is a convenient round number for reference purposes and is only loosely related to manufacturing dimensions.

NOTE 1. Nominal size is designated by the letters DN followed by the appropriate number.

NOTE 2. This definition is identical with that given in ISO 6708.

1.2.2 nominal pipe size (NPS) (for Class designated valves).

A designation of size, in inches, which is common to all components in a piping system other than those components designated by outside diameter. It is a convenient number for reference purposes and it is normally only loosely related to manufacturing dimensions.

NOTE 1. Nominal pipe size is designated by the letters NPS followed by a number.

NOTE 2. NPS is used only in association with the Class system.

1.2.3 nominal pressure (PN). A numerical designation which is a convenient rounded number for reference purposes.

All equipment of the same nominal size (DN) designated by the same PN number shall have compatible mating dimensions.

NOTE 1. The maximum permissible working pressure depends on materials, design and working temperatures and should be selected from the tables of pressure/temperature ratings given in the appropriate standards.

NOTE 2. Nominal pressure is designated by the letters PN followed by the appropriate reference number.

NOTE 3. This definition is identical with that given in ISO 7268.

1.2.4 Class. A numerical designation for reference purposes.

NOTE 1. The maximum allowable working pressure depends on materials, design and design temperature and should be selected from the tables of pressure/temperature ratings given in the appropriate standards.

NOTE 2. Class is designated by the word Class followed by the appropriate reference number.

1.2.5 Special Class. A term applied to Class designated butt-weld end valves which have specified quality requirements for body/bonnet castings (see 4.1.2), or in the case of forged valve bodies are limited in size to NPS 5 (DN 125).

1.2.6 face-to-face dimension (for flanged valves, excluding ring joint flanged valves). The distance, expressed in millimetres, between the connecting end facings upon which the gaskets are actually compressed.

1.2.7 end-to-end dimension (for valves with butt-weld ends or ring joint flanges). The distance, expressed in millimetres, between the extremities of the connecting ends.

1.2.8 centre-to-face dimension (for flanged valves).

The distance, expressed in millimetres, between the plane located at the connecting end facing upon which the gasket is actually compressed and perpendicular to its axis and the other body end port axis.

1.2.9 centre-to-end dimension (for valves with butt-weld ends). The distance, expressed in millimetres, between the plane located at the extremity of the connecting end and perpendicular to its axis and the other body end port axis.

1.3 Valve patterns and types

1.3.1 Valves shall be one of the following types:

- (a) globe having a rising stem and outside screw;
- (b) globe stop and check having a rising stem and outside screw;
- (c) lift type check.

1.3.2 Each type of valve shall be one of the following patterns, as shown in figure 1:

- (a) straight;
- (b) angle;
- (c) oblique.

1.4 Size ranges

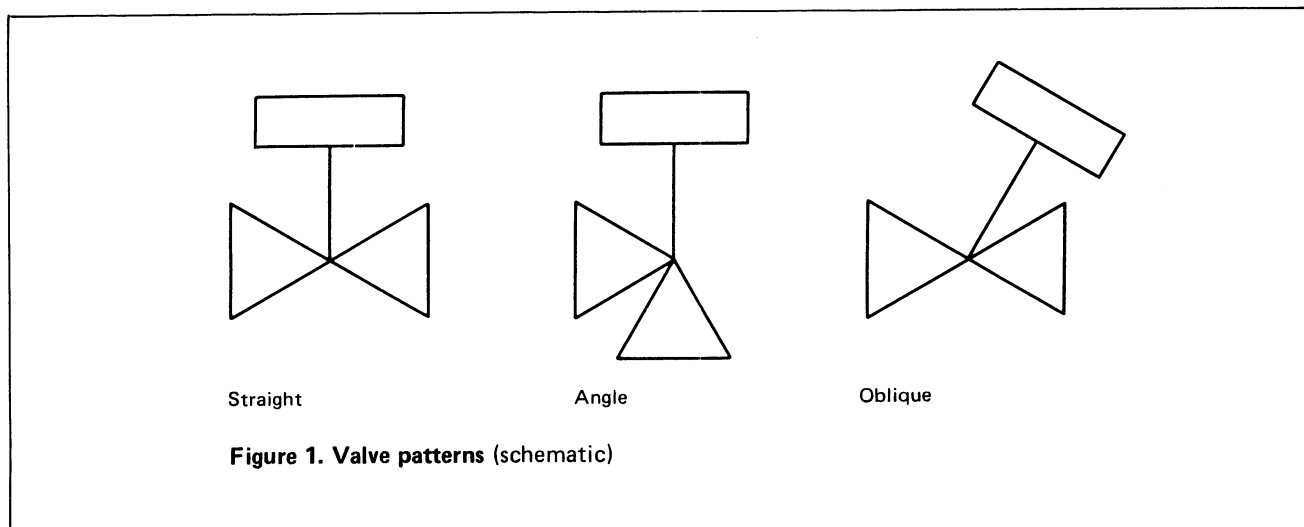
Valves shall be one of the following sizes selected from the appropriate size range.

PN designated range:

DN 15, DN 20, DN 25, DN 32,
DN 40, DN 50, DN 65, DN 80,
DN 100, DN 125, DN 150,
DN 200, DN 250, DN 300,
DN 350, DN 400, DN 450.

Class designated range:

NPS ½, NPS ¾, NPS 1, NPS 1¼, NPS 1½,
NPS 2, NPS 2½, NPS 3, NPS 4,
NPS 5, NPS 6, NPS 8, NPS 10,
NPS 12, NPS 14, NPS 16, NPS 18.



1.5 Nominal pressure (PN) and Class designations

Valves flanged in accordance with BS 4504 : Section 3.1 shall be designated by nominal pressure (PN) as follows: PN 16, PN 25 and PN 40.

Valves flanged in accordance with BS 1560 : Section 3.1 or with butt-weld ends shall be designated by Class as follows: Class 150, Class 300 and Class 600.

1.6 Pressure/temperature ratings

1.6.1 The pressure/temperature ratings applicable to valves designated by PN shall be as specified in BS 4504 : Section 3.1 for the particular body/bonnet material.

1.6.2 The pressure/temperature ratings applicable to flanged and butt-weld end valves designated by Class (except for Special Class valves) shall be as specified in BS 1560 : Section 3.1 for the particular body/bonnet material.

1.6.3 The pressure/temperature ratings applicable to Special Class butt-weld end valves shall be as given in table 1, as appropriate, for the particular body/bonnet material.

NOTE. Restrictions on temperature may be placed by the manufacturer on valves complying with this standard due to valve type, trim materials or other factors, in which case valves are marked with the limiting temperature (see 6.3).

Table 1. Pressure/temperature ratings for Special Class butt-weld end valves

Temperature	Maximum permissible working pressure		
	Class 150	Class 300	Class 600
°C	bar*	bar*	bar*
-29 to 38	20.0	51.7	103.4
50	20.0	51.7	103.4
100	20.0	51.7	103.4
150	20.0	51.7	103.4
200	20.0	51.7	103.4
250	20.0	51.7	103.4
300	19.1	49.9	99.7
350	18.4	48.1	96.3
375	18.1	47.2	94.5
400	16.5	43.1	86.3
425	13.8	35.9	71.9
450	9.6	25.0	50.1
475	6.5	16.9	33.9
500	4.2	11.0	22.0

*1 bar = 10^5 N/m² = 10^5 Pa.

NOTE. Intermediate values may be obtained by linear interpolation.

Section two. Body ends

2.1 Flanged body ends

2.1.1 Flange dimensions and facing types shall comply with the relevant requirements of BS 4504 : Section 3.1 for PN designated valves or BS 1560 : Section 3.1 for Class designated valves.

NOTE. The purchaser should state in the enquiry or order whether PN or Class designated valves are required and the type of flange facing required (see appendix A).

2.1.2 Flanges shall be at right angles to the axis of the bore and concentric with the body end port.

NOTE. The purchaser should state in the enquiry or order whether flanges without bolt holes are required. The bolt holes will be 'off-centres' unless otherwise specified in the enquiry or order.

2.1.3 Face-to-face dimensions shall be as given in table 2 for straight and oblique pattern flanged end valves except for oblique pattern globe valves and those valves with flanged body ends complying with BS 1560 : Section 3.1 and having ring joint faces.

Centre-to-face dimensions shall be as given in table 3 for angle pattern flanged end valves except for valves with flanged body ends complying with BS 1560 : Section 3.1 and having ring joint faces.

NOTE 1. For flanges with other types of facings consult the manufacturer for dimensions.

NOTE 2. The use of the face-to-face dimension given in table 2 for oblique pattern globe valves is at the manufacturer's option.

NOTE 3. The purchaser should specify in the enquiry or order the basic series of dimensions required.

Table 2. Face-to-face dimensions and tolerances for straight and oblique pattern flanged end valves

Nominal size		Face-to-face dimensions for designations						Tolerance
PN designated	Class designated	PN 16 and Class 150		PN 25, PN 40 and Class 300		Class 600		
		Basic series 10*	Basic series 1*	Basic series 21*	Basic series 1*	Basic series 5*	Basic series 2*	
DN	NPS	mm	mm	mm	mm	mm	mm	mm

*Basic series are given in BS 2080.

Table 3. Centre-to-face dimensions and tolerances for angle pattern flanged end valves							
Nominal size		Centre-to-face dimensions for designations					Tolerance
PN designated	Class designated	PN 16 and Class 150		PN 25, PN 40 and Class 300	Class 600		
		Basic series 11 *	Basic series 8 *	Basic series 8 *	Basic series 24 *	Basic series 9 *	
DN	NPS	mm	mm	mm	mm	mm	mm
15	½	57	90	90	83	105	± 2.0
20	¾	64	95	95	95	115	
25	1	70	100	100	108	115	
32	1¼	76	105	105	114	130	
40	1½	83	115	115	121	130	
50	2	102	125	125	146	150	
65	2½	108	145	145	165	170	
80	3	121	155	155	178	190	
100	4	146	175	175	216	215	
125	5	178	200	200	254	250	
150	6	203	225	225	279	275	
200	8	248	275	275	330	325	
250	10	311	325	325	394		
300	12	349	375	375	419	—	± 3.5
350	14	394	425	425	—	—	
400	16	457	475	475	—	—	
450	18	483	500	500	—	—	
*Basic series are given in BS 2080.							

2.1.4 The face-to-face and centre-to-face dimensions and tolerances of valves with flanged body ends complying with BS 1560 : Section 3.1 and having ring joint faces shall be as given in table 4 for straight and oblique pattern valves, except for oblique pattern globe valves, and in table 5 for angle pattern valves.

NOTE. The use of the face-to-face dimension given in table 4 for oblique pattern globe valves is at the manufacturer's option.

2.1.5 The body end ports shall be circular.

NOTE. Approximate values for the bore dimensions at the body end ports are given in appendix C for guidance only.

Table 4. Face-to-face dimensions and tolerances for straight and oblique pattern valves having flanges with ring joint faces

Nominal pipe size	Face-to-face dimensions for designations			Tolerance
	Class 150	Class 300	Class 600	
	Basic series 10R *	Basic series 21R *	Basic series 5R *	
NPS	mm	mm	mm	mm
½	119	164	164	± 2.0
¾	130	190	190	
1	140	229	216	
1¼	152	241	229	
1½	178	254	241	
2	216	283	295	
2½	229	308	333	
3	254	333	359	
4	305	371	435	
5	368	416	511	
6	419	460	562	
8	508	549	664	
10	635	638	791	
12	711	727	841	± 3.5
14	800	854	892	
16	927	879	994	
18	991	994	1095	

*Basic series are given in BS 2080.